I. REAL PARTY IN INTEREST

Appellant respectfully submits that the above-captioned application is assigned in its entirety to MITSUBISHI DENKI KABUSHIKI KAISHA, a company organized under the laws of Japan.

II. RELATED APPEALS AND INTERFERENCES

Upon information and belief, Appellant is not aware of any co-pending Appeal or Interference which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending Appeal.

II. STATUS OF CLAIMS

The present application was filed with claims 1-15. An Amendment Under 37 C.F.R. §1.111 was filed on October 8, 1999, amending independent claims 1 and 5 and dependent claims 2 and 6. A restriction under 35 U.S.C. § 121 was entered by the Examiner on December 27, 1999. In response thereto, an election of claims 1-4 without traverse was filed on January 24, 2000 and claims 5-15 were withdrawn from consideration. A second Amendment Under 37 C.F.R. §1.111 was filed on July 6, 2000, amending independent claim 1 and dependent claims 2-4. A third Amendment Under 37 C.F.R. §1.111 was filed on December 12, 2000, amending independent claim 1. No further amendments were made to the application. Accordingly, claims 1-4 (see attached Appendix) are the only claims currently on appeal.

IV. STATUS OF AMENDMENTS

A Request For Reconsideration Under 37 C.F.R. §1.116 was filed on July 6, 2001, without further amendment to the claims in response to the final Office Action dated March 7, 2001.

V. SUMMARY OF THE INVENTION

Appellant's invention relates to a stator for an automotive alternator system which innovatively improves power generation efficiency, thermal conductivity and winding density while reducing size, lowering weight, reducing auditory noise, reducing electromagnetic noise and reducing damage to the stator coil due to abrasion, shorting and thermal breakdown. More particularly, Appellant's invention relates to a stator including a stator core and a stator coil, wherein the stator coil has end portions which are reduced in size as compared with the prior art. These reduced stator coil end portions provide several benefits including, *inter alia*: reduced weight and cost due to the reduction in coil materials; a more dense and compact coil allowing for greater power generation efficiency; reduced coil resistance resulting in improved power generation efficiency and reduced thermal generation; increased thermal conductivity due to the reduced distance (gaps) between the stator coil end portions and the stator core; decreased wind resistance and wind noise due to reduction in size; and increased rigidity of the stator due to the reduced distance between the stator coil end portions and the stator core, which results in a reduction in electromagnetic noise as well as physical coil damage due to vibrations of the coil ends (see page 4, line 9-page 6, line 12 of Appellant's specification).

Accordingly, it is an object of Appellant's invention to provide a lightweight, low-cost stator which efficiently generates power while producing less noise (see page 6, lines 14-19 of Appellant's specification). Moreover, the stator must be easily assembled with a minimum of damage to attain this object (see page 5, lines 11-33 of Appellant's specification).

Referring to Appellant's Figures 2 and 8, in order to achieve the above-noted object, the stator 90 includes a stator coil 92 secured to a stator core 91, the stator coil having axial parallel portions 921a which are substantially parallel to the central axis of the stator 92, and coil ends 92b which project beyond the end surfaces 91b of the stator core slots 91a connecting the axial parallel portions 921a. These coil ends 92b include bridge portions 921b connecting projecting parallel portions 921a2.

Referring to Appellant's Figures 2 -4, the stator core 91 is formed from strips of thinly rolled and punched sheet metal 99 which are assembled into a laminated body 95. The strips include a band portion 91h, rectangular teeth 91c parallel to one another and perpendicular to the band portion, recess portions 91j opposite the teeth 91c in the band portion 91h, grooves 91k in teeth 91c, and recess portions 91p disposed on side surfaces 91m of the teeth 91c.

Referring to Appellant's Figures 5-7, the stator coil 92 is assembled to the laminated body 95, over the teeth 91c into the slots 91a. Once properly inserted, the ends 91d of the teeth 91c are extended longitudinally into the area of the slots 91a forming projecting portions 91r. Then the laminated body 95 is bent into a cylindrical shape and welded (91s, Figure 2) to form the completed stator core 91, and resulting completed stator 90.

VI. ISSUES

Whether Appellant's claims 1-4 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Adachi (Japanese Patent Publication No. JP 9-103052, "Adachi") in view of Glennon et al. (U.S. Patent No. 4,598,233, "Glennon").

VII. GROUPING OF CLAIMS

The rejected claims do not stand or fall together since, in addition to the patentable subject matter recited in independent claim 1, dependent claims 2-4 set forth additional limitations which are separately patentable from claim 1 and these additional recitations are not taught or suggested in the prior art as discussed hereafter. Further dependent claim 3 does not stand or fall together with dependent claim 2 on which it depends, but recites separately patentable features as set forth below.

VIII. ARGUMENTS

Appellant's claimed invention clearly defines over Adachi in view of Glennon, because Adachi in combination with Glennon does not disclose, teach or suggest Appellant's claimed stator for an automotive alternator, as set forth below.

With respect to independent claim 1, the Examiner acknowledges Adachi does not disclose a stator coil wherein inner circumferential portions of the bridge portions of the stator coil winding are placed in contact with axial end surfaces of the stator core so that there are no gaps therebetween, as clearly claimed in claim 1. The Examiner asserts that Glennon, while not specifically applying to a preformed stator coil assembly, teaches "shortening of the stator

assembly by bringing the end-turns of the coil into contact with the stator core." The Examiner relies on Glennon to teach "one of ordinary skill in the art to form a pre-formed coil such that the gaps provided between the axially arranged elements was minimized." However, Glennon does not teach such a coil. Appellant respectfully submits that the Examiner has misconstrued the proposed reference combination and/or Appellant's arguments in favor of patentability.

With respect to claim 1, the Examiner acknowledges in the Office Actions of March 7, 2001 (Paper No. 13) and September 13, 2000 (Paper No. 11) that the Adachi reference alone does not disclose a preformed stator coil having bridge portions with inner circumferential surfaces thereof in contact with axial end surfaces of a stator core such that there are no significant gaps therebetween. The Examiner relies on the Glennon reference to teach this feature (circumferential bridge portions in contact with axial end surfaces of the stator core so that there are no significant gaps therebetween). The Examiner further acknowledges (in Paper Nos. 11 and 13) that Glennon does not specifically apply to preformed stator coil assemblies. The Examiner asserts that Glennon teaches "shortening of the stator assembly by bringing the end-turns of the coil into contact with the stator core," and that the proposed Adachi-Glennon combination teaches "one of ordinary skill in the art to form a pre-formed coil such that the gaps provided between the axially arranged elements was minimized;" Paper No. 11, pages 2-3. However, neither Adachi or Glennon, alone or in combination with one another teach such a coil or stator assembly.

Adachi in combination with Glennon does not disclose, teach or suggest a preformed stator coil with bridge portions in contact with axial end surfaces of the stator core with no

significant gaps therebetween. As acknowledged by the Examiner, Adachi teaches no such feature. While Glennon discloses "end-turns" that "extend substantially circumferentially and radially" with "no appreciable extension axially," these end-turns are not part of a preformed coil as required by Appellant's claim 1 and acknowledged by the Examiner. As clearly taught by Glennon, the end-turns are brazed or similarly connected to the ends of pre-assembled conductors 52 through jogs 68 (see col. 4, lines 8-25 of Glennon). Glennon is not properly combinable with Adachi and even if so combined would not accomplish Appellant's claimed invention.

Glennon's end-turns are not part of a preformed coil as required by Appellant's claim 1, or as set forth in Adachi. Glennon clearly teaches end-turn connections 58 with curved portions 60 and 62 that are brazed or similarly connected to the ends (54, 56) of conductors 52 through jogs 68; see col. 4, lines 8-25 of Glennon. Moreover, contrary to Examiner's assertions, rectangular conductors 52 and "z-shaped" end-turns 58 do not even represent parts of a "coil," and are not "wound" as is known in the art. Each of these components is separately assembled to Glennon's "body"12; see col., lines 8-25 of Glennon. These distinctions notwithstanding, it is abundantly clear that Glennon teaches a multi-part conductor "winding" assembly that is clearly assembled after Glennon's conductors 52 are assembled within slots 50 of stator armature body 12, and end turns 58 are then connected to ends 54/56 of conductors 52. See col. 3, line 62 - col. 4, line 25 of Glennon. Such multi-part/post core insertion connected windings are clearly distinguishable from Appellant's " preformed stator coil" recited in Appellant's independent claim 1.

Further, while individually wound coils or multi-part/post core insertion connected windings (or in this case end-turn connections) might produce a winding assembly assembled to a stator core with no appreciable axial gaps, these individually wound/post-connected windings also dramatically decrease the efficiency of stator manufacturing. This obviates the specifically stated purpose of Appellant's invention, as well as the reason for preforming the coil (as required by Appellant's claim 1 and the Adachi reference) in the first instance. See page 13, line 15 - page 16, line 8 of Appellant's specification. Thus, it is not obvious that one skilled in the art would modify Adachi according to Glennon, because Glennon teaches a post core insertion connected winding which teaches away from Adachi as well as Applicant's claimed invention.

Furthermore, while preformed coils in and of themselves, as well as individually wound coils or multi-part/post core insertion connected windings with no gaps when assembled to a stator, might be argued to be known in the art, preformed coils without gaps, as claimed in Appellant's claim 1 are not known. Prior to Appellant's invention, preformed stator coils could not be assembled to stator cores without gaps therebetween, or without damage to the coils. See page 5, lines 11-33 of Appellant's specification. Therefore, it is not obvious that one skilled in the art would modify Adachi according to Glennon as proposed by the Examiner, because Glennon teaches away from Adachi as well as Appellant's claimed invention, in that Glennon teaches a winding assembled/connected after insertion into a core.

The Examiner has set forth no reasoning refuting Appellant's arguments in favor of patentability, or Appellant's statement's that the prior art does not teach a preformed stator coil without gaps between its inner circumferential surface and end surfaces of a stator core.

Specifically, even if one of skill in the art were to modify/combine Adachi in view of Glennon as proposed by the Examiner, the resulting winding could not be assembled to the resulting stator core without damaging the winding and/or some appreciable gap therebetween.

The Examiner has failed to establish a *prima facie* case of obviousness. The Examiner, at most, seems to make out an argument that it would have been "obvious to try" to make the proposed Adachi-Glennon combination and to modify the Adachi by "shortening the stator assembly by bringing the end-turns of the coil into contact with the stator core," such that the proposed Adachi-Glennon combination teaches "one of ordinary skill in the art to form a pre-formed coil such that the gaps provided between the axially arranged elements was minimized." As set forth above Appellant submits this is not the case, nonetheless, the Examiner's position amounts to an impermissible "obvious to try" rejection. In short, the Examiner seems to be asserting that it would have been obvious to attempt to shorten Adachi's coil-ends to form a coil as recited in Appellant's claims. Both In re O'Farrell, 853 F2d 894, 7 USPQ2d 1673 (Fed. Cir. 1998), and In re Geiger, 815 F2d 686, 2 USPQ2d 1276 (Fed. Cir. 1987) address this impermissible "obvious to try" standard. "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." Geiger, 815 F2d at 687. A claimed invention is not rendered obvious, where the prior art fails to teach an overlapping range, a critical parameter, or to suggest a direction of experimentation, by the mere fact that the prior art discloses the parameter. O'Farrell, 853 F2d 894, 897. In the present case, the prior art does not even teach "a pre-formed coil such that the gaps provided between the axially arranged elements was

minimized," as asserted by the Examiner and explained above. In fact Glennon teaches away from a preformed coil, as previously discussed. Thus, Appellants' claimed invention would not have been obvious to one of skill in the art.

With respect to claim 2, this claim is dependent upon non-obvious independent claim 1 and is patentable at least for the reasons set out above. Additionally, Appellant's claim 2 clearly recites a stator core having longitudinally (circumferentially) disposed teeth which are provided with grooves in the end surfaces thereof and recessed portions on both sides of the teeth near the ends. These grooves are further recited to be perpendicular to a band portion of the stator core (parallel with the direction of the teeth), such that circumferentially projecting portions are formed. Adachi does not teach, disclose or suggest this or any similar structure. Adachi merely discloses circumferentially projecting portions on the end of its teeth. It does not disclose grooves or recesses in a pre-finished stator core which form these portions in a finished stator core. Furthermore, since these circumferentially projecting portions always project from Adachi's stator core teeth, when a preformed stator coil is assembled to Adachi's stator core, the stator coil will be damaged unless a significant amount of coil-end space is allowed; see page 5, line 26-33 of Appellant's specification. This further teaches away from both Appellant's claimed invention, the Glennon reference (which the Examiner asserts teaches no such gaps) and the Examiner proposed Adachi-Glennon combination. Similarly, Glennon discloses a magnetizable body 12 (stator) enclosed by a seal (90, 91) having slots 50 in which conductors 52 are assembled. No preformed stator coil, or pre-finished stator core with grooves or recesses is

disclosed. Therefore, claim 2 is not and cannot be rendered obvious by the proposed Adachi-Glennon combination.

With respect to claims 3 and 4, claim 3 is dependant upon non-obvious dependent claim 2 and claim 4 is dependent on non-obvious independent claim 1, and these claims are patentable at least for the reasons set out above. Further, Adachi in combination with Glennon does not disclose that a preformed stator coil has a flat planar shape. Nowhere within either reference is any mention of a preformed stator core made, much less that such a core has a flat planar shape. Thus, claims 3 and 4 are not and cannot be rendered obvious by the Adachi-Glennon combination.

Therefore, Appellant respectfully submits that it is far from obvious that Adachi could be modified in view of Glennon to achieve Appellant's invention of claims 1-4. It is clear that the disclosures of Adachi and Glennon, individually or in combination, do not teach the Appellant's claimed invention. In fact as set out above, Glennon teaches away from both Adachi and Appellant's invention of claims 1-4. More specifically, an artisan of ordinary skill would not have and could not have applied the references in the manner suggested by the Examiner to produce the subject matter of the claimed invention, because of the clear differences between the cited references and Appellant's claimed invention. In view of these differences, it is respectfully submitted that the cited references do not establish a *prima facie* case of obviousness against Appellant's claims, as one of ordinary skill in the art would have had to add to these references additional features which are neither described nor suggested by the cited references.

While the teaching, motivation or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references, see WMS Gaming, Inc. v. International Game Technologies, 184 F.3d 1339, 1355, 51 USPQ2d 1385, 1397 (Fed. Cir. 1999), the test for an implicit showing requires that the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole suggest the invention to those of ordinary skill in the art. See In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981) (and cases cited therein). Whether the Examiner relies on an express or an implicit showing, this showing must be clear and particular, and broad conclusory statements about the teaching of multiple references or the modification of a reference, standing alone, are not "evidence." The Examiner must provide particular findings related to such a showing. See In re Dembiczak, 175 F.3d 994, 999-1000, 50 USPQ2d 1614, 1617. This determination also includes a second requirement, that is, a reasonable expectation of success. See In re O'Farrell, 853 F.2d 894, 903-904, 7 USPQ2d 1673, 1681(Fed. Cir. 1988); see also In re Longi, 759 F.2d 887, 897, 225 USPQ 645, 651-52(Fed. Cir. 1985). In this particular case, the Examiner has provided absolutely no evidence whatsoever as to why one of ordinary skill would modify Adachi's stator coil to reduce the distance between the stator core end surfaces and the coil, much less how such a stator coil might be assembled in accordance with Applicant's claims 1-4.

Appellant has argued that the references can not be combined because they teach away from one another and especially Appellant's claimed invention. *See* Tec Air Inc. v. Denso Manufacturing Michigan Inc., 192 F.3d 1353, 52 USPQ2d 1294 (Fed. Cir. 1999).

Since the Adachi and Glennon references clearly teach away from one another as set out above, they are not properly combinable. The motivation asserted by the Examiner to combine these references, that the "suggestion of Glennon is clearly to reduce the axial length of the stator by minimizing end turns, which in combined with Adachi suggests prewound coils in contact with the end of the stator to reduce axial length of the alternator," is in fact contradicted by the explicit teachings of the references themselves, which teach away from making such a combination. Such a combination/modification of the references, as asserted by the Examiner, will destroy the intent, purpose and/or function of the particular invention disclosed in each reference. Thus creating a disincentive rather than a motivation to combine/modify the references. See In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). References must be considered for their teachings as a whole. See Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966) (§103 requires consideration, *inter alia*, of differences between prior art and claimed invention as a whole).

Furthermore, as discussed above, the cited references actually teach away from one another and Appellant's invention. Thus, one of ordinary skill at the time of Appellant's conception of the present invention would not have even attempted to combine/modify the references as asserted by the Examiner to accomplish Appellant's claimed invention. Essentially, teaching away is a *per se* demonstration of a lack of a *prima facie* case of obviousness. In re Dow Chemical Co., 837 F.2d 469, 5 USPQ2d 1529 (Fed. Cir. 1988); In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Thus, the Examiner has not made out a *prima facie* case of obviousness by attempting to combine the cited references.

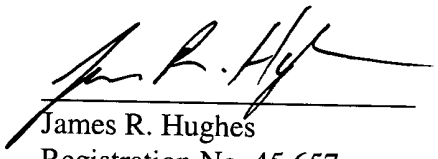
In order to combine or modify references, and establish a *prima facie* case of obviousness, the Examiner must show by clear and particular evidence the motivation, suggestion or teaching to combine or modify the references and how or why such modification or combination is within the skill of one in the art. See In re Dembiczak, 175 F.3d at 999-1000, 50 USPQ2d at 1617. Even where all the elements of an invention are taught in the prior art references or known in the art, which in this case they are not, the Examiner cannot merely combine or modify these disclosed elements. The Examiner cannot rely on what he/she presumes is the level of knowledge of one of ordinary skill in the art at the time of the invention to supply the missing modifications, "skill in the art does not act as a bridge over gaps in substantive presentation of an obviousness case." Al-cite Corp. v. VSI International, Inc., 50 USPQ2d 1161, 1171 (Fed.Cir. 1999). Just because one skilled in the art may have had the capability of assembling the invention is not sufficient to establish a *prima facie* case of obviousness. The Examiner must "show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for a combination in the manner claimed." In re Rouffet, 47 USPQ2d 1453 (Fed.Cir. 1998). The mere fact that references can be "combined or modified does not render the resultant combination [or modification] obvious unless the prior art also suggests the desirability of the combination [or modification]." In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed.Cir. 1990); MPEP §2143.01

Clearly, the teachings of Adachi and Glennon, whether taken alone or in combination, fail to teach or suggest Appellant's stator assembly as set forth above with respect to claims 1-4. Accordingly, the rejection of the claims should be reversed and the claims passed to issue.

The present Brief on Appeal is being filed in triplicate. Unless a check is submitted herewith for the fee required under 37 C.F.R. §1.192(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

Appellant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,



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APPENDIX

CLAIMS 1-4 ON APPEAL:

1. (Three Times Amended) A stator for an automotive alternator comprising:

a stator core having a plurality of slots; and

a preformed stator coil including a cluster of three phases of connected stator windings having:

axially parallel portions which are substantially parallel to the central axis of said stator coil, said axially parallel portions comprising current generating portions disposed within said slots of said stator core and generating electric current, and projecting portions which project from the axial ends of said slots; and

bridge portions comprising circumferential portions connecting said axially parallel portions to each other within each of said three phases of windings;

wherein inner circumferential surfaces of said bridge portions are placed in contact with the axial end surfaces of said stator core without any gaps in the direction of the central axis of said stator core, so that the spatial ratio occupied by said stator windings belonging to said bridge portions exposed beyond said axial end surfaces of said stator core, has a high density.

2. (Twice Amended) The stator for an automotive alternator according to Claim 1, wherein said stator core comprises:

in a prefinished stator core, a plurality of comb-shaped strips each having a band portion; and

a plurality of teeth disposed substantially parallel to each other extending perpendicularly relative to the longitudinal direction of said band portion;

in the finished stator core, said plurality of strips being laminated and formed into a cylindrical shape; and

end surfaces of said teeth in said prefinished stator core being provided with grooves perpendicular to the longitudinal direction of said band portion and recessed portions on both sides of said teeth near said ends, so as to form circumferentially projecting portions in said finished stator core.

3. (Amended) The stator for an automotive alternator according to Claim 2, wherein said preformed stator coil is a flat planar shape prior to assembly with the finished stator core.

4. (Amended) The stator for an automotive alternator according to Claim 1, wherein said preformed stator coil is a flat planar shape prior to assembly with the finished stator coil.

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Yoshihito ASAO

Appln. No.: 09/277,198 Group Art Unit: 2834

Confirmation No.: Not Yet Assigned Examiner: K. Tamai

Filed: March 26, 1999

For: STATOR FOR AN AUTOMOTIVE ALTERNATOR AND METHOD OF MANUFACTURE THEREFOR

SUBMISSION OF APPELLANT'S BRIEF ON APPEAL

Commissioner for Patents
Washington, D.C. 20231

Sir:

Submitted herewith please find an original and two copies of Appellant's Brief on Appeal. Authorization is given to charge the statutory fee of $320.00 to Deposit Account No. 19-4880. Authorization is also given to charge or credit any difference or overpayment to Deposit Account No. 19-4880. A duplicate copy of this paper is attached.

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